Understanding the Structure and Function of the Circulatory System

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Understanding the structure and function of the circulatory system

Q1

Tick which statement is true from the two following statements.

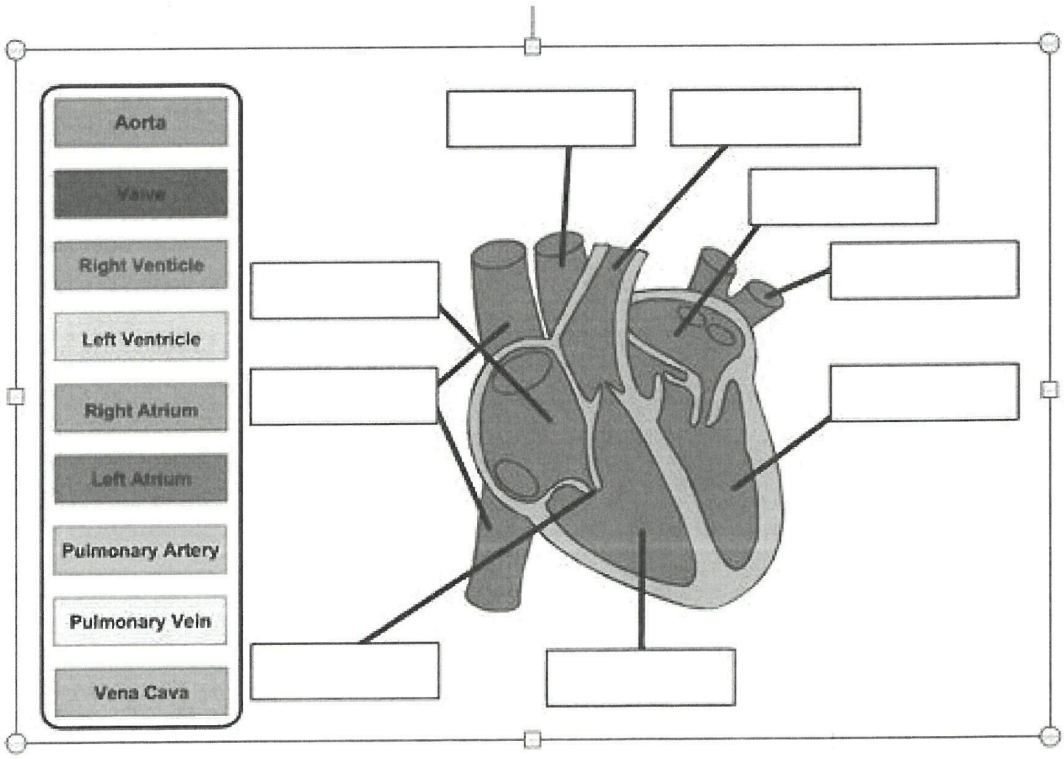
	Tick one
The heart is located on the left-hand side of the chest cavity	
The heart is located on the right-hand side of the chest cavity	

Q2

Describe the main function of the heart.

Q3

Complete the diagram by identifying the different chambers and major blood vessels of the heart



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Q4

Using all the answers given in the previous question complete the flow table of blood through the heart. You must provide a description of the functions of each of the structures.

Learner Guidance:

- You must describe where it receives blood from and transports it to
- Identify whether it carries oxygenated or deoxygenated blood

Structure	Function
Pulmonary Vein	Major vein that carries oxygenated blood from the lungs to the heart
Left Atrium	
Left Ventricle	
Aorta	.
Working Muscles	Oxygenated blood is delivered to the working muscles
Vena Cava	
Right Atrium	
Right Ventricle	
Pulmonary Artery	

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Q5

Describe the role of the valves in the heart.

Q6

Describe systemic circulation.

Q7

Describe pulmonary circulation.

Q8

Describe two differences between the structure of arteries and veins

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Q9

Describe two differences between the function of arteries and veins

Q10

Describe the role of capillaries.

Q11

Describe one feature of a capillary that enable them to perform their role.

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Q12

Define the following terms.

Blood Pressure	
Systolic Pressure	
Diastolic Pressure	
Hypotension	
Hypertension	

Q13

According to the NHS what range of blood pressure would be classified as normal?

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Q14

According to the NHS, at what reading or higher would classify as high blood pressure?

Understand the structure and function of the respiratory system

Q1 Describe where in the body the lungs are located.

Q2

Describe the function of the lungs.

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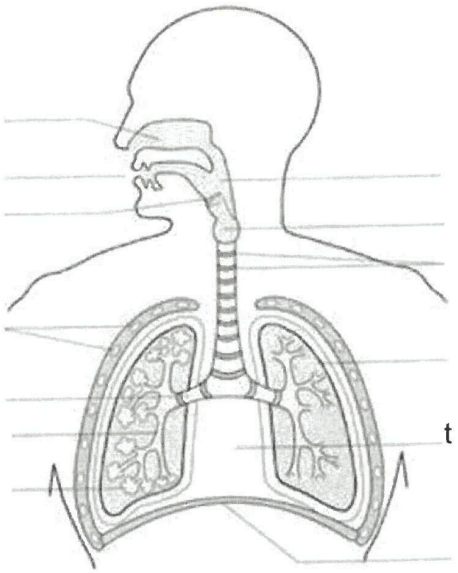
Q3

Complete the diagram below by filling in the boxes and identifying the different structures of the respiratory system.

Diaphragm
Lung
Pharynx
Bronchiole
Bronchus
Ribs
Mouth
Alveolus
Nasal Cavity
Rings of Cartilage
Space occupied by the heart
Larynx
Epiglottis



Q4

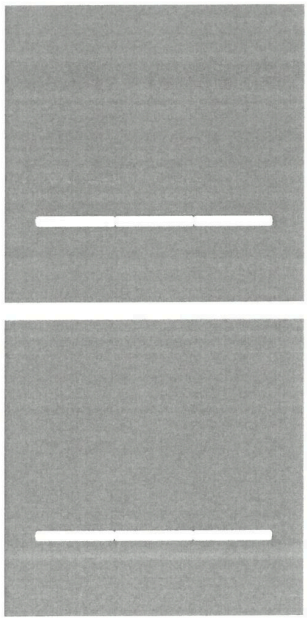
Using some of the answers given in the previous question complete the flow table of air through the respiratory system. You must provide a description of the functions of each of the structures.

Structure	Function
Nasal Cavity	
Pharynx	
Larynx	
Epiglottis	

Bronchus	
Bronchiole	
Alveolus	
Diaphragm	

Q5

Identify two major muscles involved in respiration.



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Q6

Where in the lungs does gaseous exchange take place?

Q7

Describe the movement of oxygen and carbon dioxide in the lungs during gaseous exchange.

Understand the structure and function of the skeleton

Q1

Describe the five functions of the skeleton.

Function	Description
Shape/Structure	
Movement	
Soft tissue attachment	
Protection of organs	
Storage of minerals	

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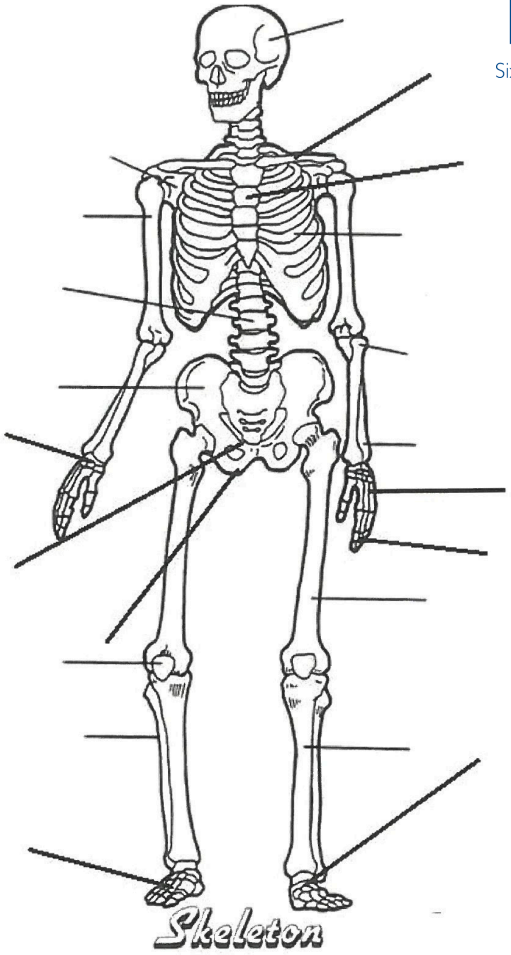
Q2 Correctly label the skeleton, use all the bones

Cranium
Clavicle
Ribs
Sternum
Humerus
Radius
Ulna
Scapula
Ilium
Pubis
Ischium
Carpals
Metacarpals
Phalanges
Femur
Patella
Tibia
Fibula
Tarsals
Metatarsals
Vertebral Column



Q3

Identify three bones that are part of the axial skeleton

Q4

Identify four bones that are part of the appendicular skeleton

Q5

There are five different classifications of bone, complete the table below by providing an example and explaining its function.

- Learner Guidance: Explain requires more analysis to demonstrate your understanding of the topic, short paragraph.

Type of bone	Example	Function
LONG BONES		
SHORT BONES		
FLAT BONES		
IRREGULAR BONES		
SESAMOID		

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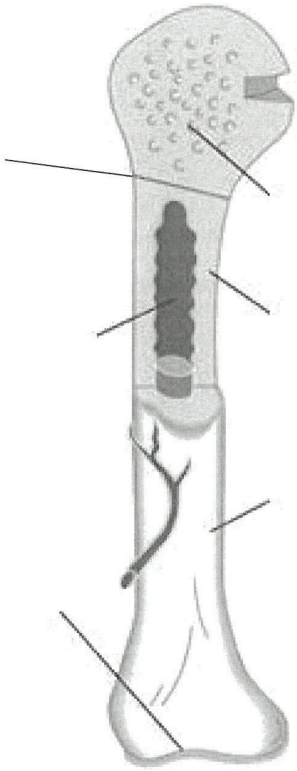
Q6

Identify the structure of a long bone by labelling the diagram.

Learner guidance: use structures of the long bone found on question 7 on the next page



Q7

For each of the structures of the long bone you have labelled in the previous question, complete the table below to explain their structure in more detail.

Structure	Explanation
Medullary Cavity	
Articular Cartilage	
Spongy Bone	
Compact Bone	
Periosteum	
Growth Plate	

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Q8

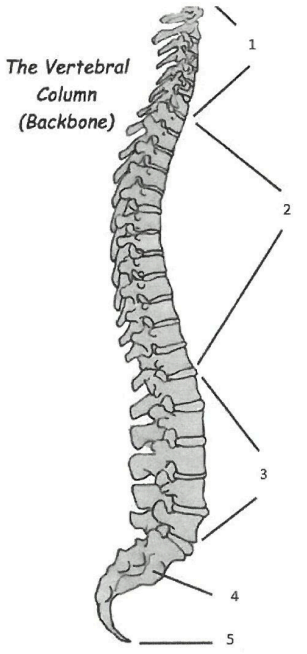
Explain the five stages of ossification (bone growth).

1	
2	
3	
4	
5	

Q9

Label the different sections of the spine using all the sections in the box below.

Lumbar
Thoracic
Sacrum
Cervical
Coccyx



Q10

From the different sections labelled in the previous question, describe the potential ranges of motion of each section.

Section	Potential Ranges of Motion
cervical	
thoracic	
lumbar	
sacrum	
coccyx	

Q11

Describe what is meant by the term 'neutral spine'.

Q12

Which area of the spine would you expect to see the following natural curves?

Kyphotic

Lordotic

Q13

Describe how a Lordotic spine affects the normal shape of the spine.

Q14

Describe how a Kyphotic spine affects the normal shape of the spine.

Q15

Describe how Scoliosis of the spine affects the normal shape of the spine.

Q16

Describe how pregnancy can affect the normal shape of the spine.

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Understand joints in the skeleton

Q1

Complete the table below of the different classification of joints, include the potential movement available at each.

Classification of joint	Location of joint	Potential movement of joint
Elbow Joint.		
Knee Joint.		
Wrist Joint.		

Q2

Describe the structure of the synovial membrane.

Q3

Describe the structure of the articular cartilage.

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Q4

Describe the six different types of synovial joints and state the range of motion available at each.

Q5

What joint actions are possible at the following joints?

Elbow

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Spine Learner guidance: name at least 3 joint actions

Hip Learner guidance: name at least 4 joint actions

Q6

Describe each of the following joint actions and provide an example of a joint where it can occur.

Extension

Abduction

Plantar Flexion

20

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Understand the muscular system

Q1

Complete the table below.

Different types of muscle tissue	Main characteristics	Main role
skeletal muscle		
smooth muscle		
cardiac muscle		

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Q2

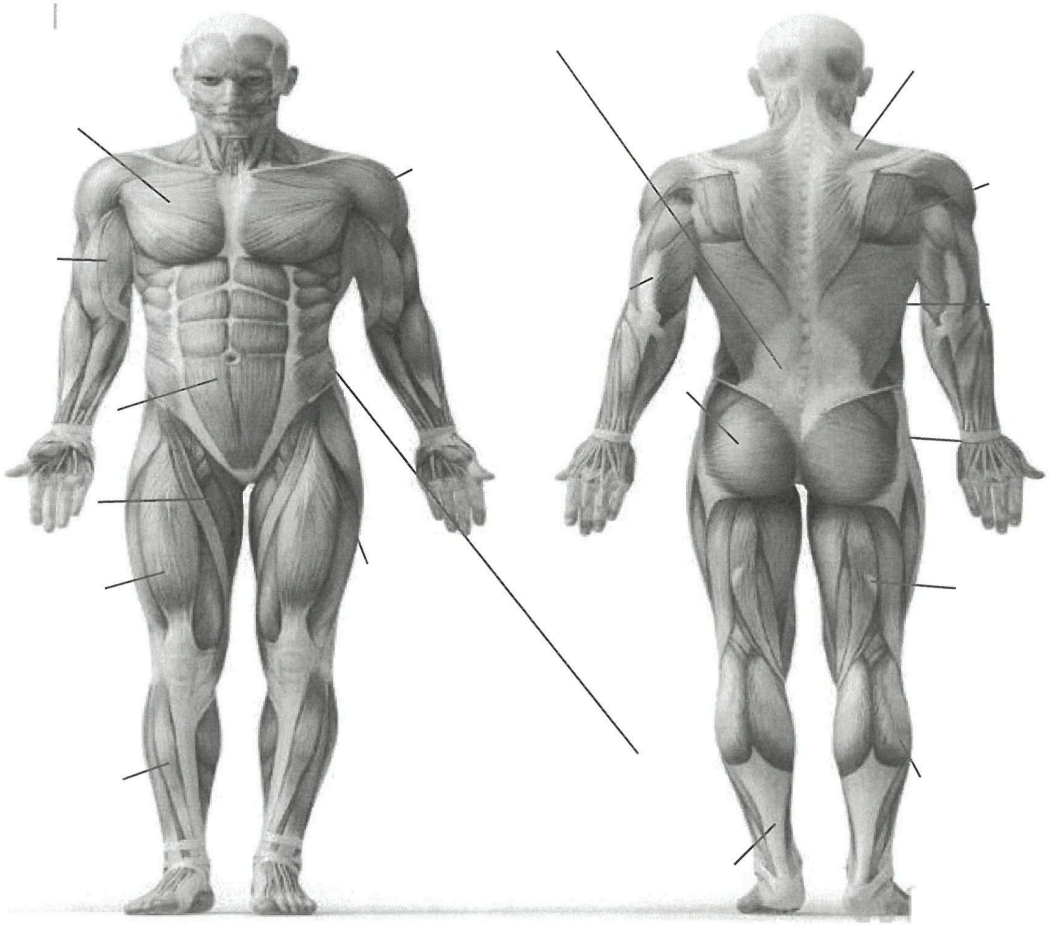
Complete the table below by describing the main structural points of a skeletal muscle.

Structure	Description
Muscle Fibre	
Fascicle	
Fascia	
Sarcomere	
Myofibril	

Q3 Label the skeletal muscles using the muscles from the list below, and identify what joint action each one allows.

Learner guidance: when describing joint actions please identify the limb/body part moving

Muscle to locate	Action it allows
Rectus Abdominis	Flexion of the spine
Pectoralis Major	
Deltoids	
Tibialis Anterior	
Biceps Brachii	
Obliques	
Soleus	
Gastrocnemius	
Teres Major	
Gluteus Maximus	
Triceps Brachii	
Trapezius	
Erector Spinae	
Latissimus Dorsi	
Hamstrings	
Quadriceps	
Abductors	
Adductors	
Hip Flexors	



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Q4

Describe the structure of the pelvic floor muscles.

Q5

Describe two functions of the pelvic floor muscles.

Q6

Describe an concentric muscle contraction.

Q7

Describe an eccentric muscle contraction.

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Q8

Describe an isometric muscle contraction.

Q9

Identify the joint action occurring in a barbell bicep curl during the concentric phase.

Q10

Identify the joint action occurring in a barbell bicep curl during the eccentric phase.

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Q11

Complete the table below by identifying three different muscle fibre types and their main characteristics.

Muscle fibre types	Characteristics
Slow-twitch muscle fibres (slow oxidative glycolytic)	
Fast-twitch muscle fibres (fast glycolytic)	
Intermediary muscle fibres (Fast oxidative glycolytic)	

Understand the life-course of the musculoskeletal system and its implications for special populations exercise

Q1

Describe two physical changes, and their implications for exercise, when training young people (in the 14-16 age range)

Leaner Guidance: Think about what effect training can have on tendons, ligaments, muscles, joint and bone mineral density changes.

Q2

Describe two physical changes, and their implications for exercise, when training older people (50 plus age range)

Leaner Guidance: Think about what effect training can have on tendons, ligaments, muscles, joint and bone mineral density changes.

Q3

Describe two physical changes, and their implications for exercise, when training antenatal and postnatal women.

Leaner Guidance: Think about what effect training can have on tendons, ligaments, muscles, joint and bone mineral density changes.

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Understand energy systems and their relation to exercise

Q1

What does ATP stand for?

Q2

Describe what the role of carbohydrates, fats and protein are in the production of energy.

Q3

Explain the use of the creatine phosphate (CP) or phosphocreatine system during exercise.

Learner Guidance

- Include what nutrients or compound the energy system will use to resynthesis energy
- Explain the types of activity/exercise that the energy system will fuel.

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Q4

Explain the use of the lactic acid system/anaerobic system during exercise.

Learner Guidance

- Include what nutrients or compound the energy system will use to resynthesis energy
- Explain the types of activity/exercise that the energy system will fuel.

Q5

Explain the use of the aerobic system during exercise.

Learner Guidance

- Include what nutrients or compound the energy system will use to resynthesis energy
- Explain the types of activity/exercise that the energy system

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Understand the nervous system and its relation to exercise

Q1

Describe three roles and functions of the nervous system.

Q2

Describe the principles of muscle contraction.

Learner Guidance – What are the role of nerves in muscle contraction? Think about nerve impulses

Q3

Describe the 'all or none' law.

Learner Guidance – Think about motor unit recruitment

Q4

Describe what determines whether or not a contraction takes place within a motor unit.

Q5

Describe two adaptations that occur in the neuromuscular system with regular exercise that improves motor fitness.